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10/587,163

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EXAMINER

GARDNER, SHANNON M

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

06/22/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|------------------------------|--------------------------------------|------------------------------------|--|
| Office Action Summary | Application No. 10/587,163 | Applicant(s) KUBO ET AL. | |
| | Examiner Shannon Gardner | Art Unit 1795 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2010 (After Final).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 5-13 is/are pending in the application.
- 4a) Of the above claim(s) 11-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 5-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Remarks

Claims 1, 2 and 5-13 are pending in the application. Claims 11-13 remain withdrawn as per a previous restriction requirement. Claims 1, 2 and 5-10 are rejected below.

Status of Objections and Rejections

All rejections from the previous office action are withdrawn in view of Applicant's arguments. New grounds of rejection are set forth below.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 2, 5 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe (JP 2002-050413, machine translation previously provided) in view of Granqvist et al. (US 20050238550) and Ohya et al. (US 6629833).

As to claim 1, Abe is directed to a laminated film for a dye-sensitized solar cell (abstract, paragraph [0001]) characterized by comprising:

- A polyester film (PET) (paragraph [0005]) and
- A transparent conductive layer (ITO) formed on one side thereof (paragraph [0005])

Art Unit: 1795

Abe teaches the polyester film being PET which is disclosed by Applicant in the Specification as a material for the film (pp 3, lines 12-16). Abe is silent as to the PET film having a light transmittance of no greater than 3% at a wavelength of 370 nm and a light transmittance of 70% or greater at 400nm.

However, it is known in the art that a light transmittance of 70 % or greater at 400 nm is an inherent characteristic of PET. It is further known that a polyester film is degraded by UV-radiation and therefore the addition of a UV-absorber enhances the stability of such a polyester film as taught by Granqvist (paragraph [0029]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a UV-absorber to the PET film of Abe as taught by Granqvist to limit the UV radiation transmitted by the film to prevent degradation. Further, it would have been obvious to one of ordinary skill in the art to modify the amount of UV absorber present in the film to achieve the lowest UV transmittance possible (ideally 0%).

Though Abe teaches a transparent conductive layer formed on one side of the polyester film, he is silent as to the surface tension of the transparent conductive layer being 40 mN/m or greater.

However, it is known in the art that a surface tension of 30-65 dyne/cm (mN/m) of a transparent conductive film makes it possible to give strong adhesion between adjacent layers as taught by Ohya (column 3, lines 7-10). Ohya teaches a transparent conductive film (12) on a polyester containing layer (P).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a surface tension of 30-65 dyne/cm to the transparent conductive film of Abe to provide a strong adhesion between the adjacent layers as taught by Ohya. In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a prima facie case of obviousness exists (see MPEP § 2144.05 and *In re Wertheim*).

The PET polyester film of Abe will inherently have an absolute value of no greater than 0.8% for the difference in the heat shrinkage rates in the lengthwise direction and widthwise direction of the film. If it is not taken that this property is inherent, then it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat shrinkage rates of the polyester film to maintain similar shrinkage in both directions (length and width wise) as evidenced by Applicant's Specification (pp 8, line 28 to pp 9, line 11) thereby having an absolute value of no greater than 0.8% for the difference. Further, the limitation of “upon treatment of 10 minutes at 200°C” is directed to a method step (a method of testing) and it not given patentable weight in the claim.

Regarding claim 2, modified Abe teaches the surface tension of the transparent conductive film being 35-60 dyne/cm (see Ohya; column 3, lines 7-10). A *prima facie* case of obviousness exists where the claimed ranges and prior art ranges do not overlap but are close enough that one skilled in the art would have expected them to have the same properties (see MPEP § 2144.05 and *Titanium Metals Corp. of America v. Banner*).

Regarding claim 5, modified Abe is silent as to the polyester film having a heat shrinkage of 0-0.5% in the lengthwise direction of the film.

However, as noted by Applicant's Specification (pp 8, line 28 to pp 9, line 11) the modifications of a film by a heat treatment step or a heat relaxation step to alter the heat shrinkage rates in the lengthwise and widthwise direction are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to try to modify the heat shrinkage in the lengthwise direction of the film of modified Abe as taught by Applicant's Specification to achieve a desired level of shrinkage.

The Examiner notes that "upon treatment for 10 minutes at 200°C" is directed to a method step (a method of testing). Therefore, this limitation is not given patentable weight in the claim.

Regarding claim 9, Abe et al. teaches an electrode for a dye-sensitized solar cell electrode (abstract) comprising a laminated film for a dye-sensitized solar cell (PET and ITO; abstract and paragraph [0001]) and a porous semiconductor layer formed on the transparent conductive layer (abstract).

Regarding claim 10, Abe et al. teaches the porous semiconductor layer comprising titanium oxide (paragraph [0052]).

3. Claims 1, 5, 8-9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (US 6291763) in view of Granqvist et al. (US 20050238550) and Ohya et al. (US 6629833).

Art Unit: 1795

As to claim 1, Nakamura is directed to a laminated film for a dye-sensitized solar cell (abstract) characterized by comprising:

- A polyester film (PET) (column 6, lines 8-13) and
- A transparent conductive layer (ITO) formed on one side thereof (column 5, lines 57-63)

Nakamura teaches the polyester film being PET which is disclosed by Applicant in the Specification as a material to be used for the film (pp 3, lines 12-16). Nakamura is silent as to the PET film having a light transmittance of no greater than 3% at a wavelength of 370 nm but teaches “substantial transparency” (a light transmittance of 70% or greater) at 400nm-900nm.

However, it is known that a polyester film is degraded by UV-radiation and therefore the addition of a UV-absorber enhances the stability of such a polyester film as taught by Granqvist (paragraph [0029]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add a UV-absorber to the PET film of Nakamura as taught by Granqvist as to limit the UV radiation transmitted by the film to prevent degradation. Further, it would have been obvious to one of ordinary skill in the art to modify the amount of UV absorber present in the film to achieve the lowest UV transmittance possible (ideally 0%).

Though Nakamura teaches a transparent conductive layer formed on one side of the polyester film, he is silent as to the surface tension of the transparent conductive layer being 40 mN/m or greater.

However, it is known in the art that a surface tension of 30-65 dyne/cm (mN/m) of a transparent conductive film makes it possible to give strong adhesion between adjacent layers as taught by Ohya (column 3, lines 7-10). Ohya teaches a transparent conductive film (12) on a polyester containing layer (P).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide a surface tension of 30-65 dyne/cm to the transparent conductive film of Nakamura to provide a strong adhesion between the adjacent layers as taught by Ohya. In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists (see MPEP § 2144.05 and *In re Wertheim*).

The Examiner notes that the PET polyester film of Nakamura will inherently have an absolute value of no greater than 0.8% for the difference in the heat shrinkage rates in the lengthwise direction and widthwise direction of the film. If it is not taken that this property is inherent, then it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the heat shrinkage rates of the polyester film to maintain similar shrinkage in both directions (length and width wise) as evidenced by Applicant's Specification (pp 8, line 28 to pp 9, line 11) thereby having an absolute value of no greater than 0.8% for the difference. Further, the Examiner asserts that the limitation of "upon treatment of 10 minutes at 200°C" is directed to a method step (a method of testing) and it not given patentable weight in the claim.

Regarding claim 5, modified Nakamura is silent as to the polyester film having a heat shrinkage of 0-0.5% in the lengthwise direction of the film.

However, as noted by Applicant's Specification (pp 8, line 28 to pp 9, line 11) the modifications of a film by a heat treatment step or a heat relaxation step to alter the heat shrinkage rates in the lengthwise and widthwise direction are well known in the art.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to try to modify the heat shrinkage in the lengthwise direction of the film of modified Nakamura as taught by Applicant's Specification to achieve a desired level of shrinkage.

The Examiner notes that "upon treatment for 10 minutes at 200°C" is directed to a method step (a method of testing). Therefore, this limitation is not given patentable weight in the claim.

Regarding claim 8, modified Nakamura teaches an anti-reflection layer on the side of the laminated film opposite the transparent conductive layer side (column 31, lines 46-50).

Regarding claims 9 and 10, modified Nakamura teaches an electrode for a dye-sensitized solar cell electrode comprising a laminated film for a dye-sensitized solar cell according to claim 1 (see full discussion of references above) and a porous semiconductor (TiO_2) layer formed on its transparent conductive layer (ITO) (column 4, lines 61-67; column 5, lines 57-62; column 6, lines 34-35).

4. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura (US 6291763) in view of Granqvist et al. (US 20050238550) and Ohya et al. (US 6629833) as applied to claim 1 above, and further in view of Tamai et al. (US 20020037399).

Regarding claims 6 and 7, Applicant is directed above for a full discussion of Nakamura in view of Granqvist and Ohya as applied to claim 1. Modified Nakamura is silent as to the laminated film further comprising a readily adhesive layer with a thickness of 10-200 nm between the polyester film and the transparent conductive layer and as to a hard coat layer between the readily adhesive layer and the transparent conductive layer.

However, it is known in the laminated film art to utilize a readily adhesive layer (4) such as a resin (paragraph [0049]) as taught by Tamai to ensure proper and longstanding adhesion between two adjacent layers.

Further, Tamai teaches a hard coat layer (2/3) above the readily adhesive layer to help protect and prevent cracking (paragraph [0081]-[0082]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a readily adhesive layer such as a resin as taught by Tami between the polyester and transparent conductive films of modified Nakamura and a hard coat layer between the readily adhesive layer and the transparent conductive layer to ensure proper and longstanding adhesion between the two layers.

The references are silent as to the readily adhesive layer having a thickness of 10-200 nm. However, in *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that, where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device

Art Unit: 1795

was not patentably distinct from the prior art device. Further, it would have been obvious to one of ordinary skill in the art to modify the thickness of the layer to achieve the desired adhesion strength as evidenced by Tamai (paragraph [0086]).

Response to Arguments

5. Applicant's arguments, see pp 2-9, filed 5/25/2010, with respect to the rejection(s) of claim(s) 1-2 and 5-10 under Abe, Nakamura, Murschall and Tamai have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Granqvist and Ohya.

Applicant argues that the PET layer taught by modified Abe will not inherently have transmittance less than 3% at 370 nm and that an ultraviolet absorber is needed to achieve the desired transmittance (pp 4 of Arguments). The Examiner respectfully agrees. However, upon further search the claims are now rejected in view of Granqvist and Ohya who teach that it is known in the art to add to UV absorber to prevent degradation of the polyester.

Applicant argues that "means to achieve [the] heat shrinkage rates property are not only merely by a heat treatment step of a heat relaxation step, but also by heat treatment performed at specific temperature range" (pp 4 of Arguments).

The Examiner is unclear as to Applicant's intention with the above argument. Again Applicant is reminded that the limitation of "upon heating for 10 minutes at 200°

Art Unit: 1795

C" is drawn to a method step (a method of testing) present in a product claim. Because of this, the limitation is not given patentable weight in the claim.

Applicant argues that "Murschall et al. does not disclose a laminate film for a dye-sensitized solar cell containing a polyester film and a TCF...mentions a surface tension of polyester film but is silent as to the surface of the TCT" (pp 5 of Arguments).

The Examiner respectfully agrees. New grounds of rejection are made in view of Ohya who teaches the surface tension of a transparent conductive layer being 35-60 dyne/cm (mN/m) to achieve good adhesion between adjacent layers.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shannon Gardner whose telephone number is (571)270-5270. The examiner can normally be reached on Monday to Thursday, 5am-3pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571.272.1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1795

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/S. G./

Examiner, Art Unit 1795

/Keith Walker/

Primary Examiner, Art Unit 1795